

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512



DATE: March 8, 2004

TO: Interested Parties

FROM: Nancy Tronaas, Compliance Project Manager

SUBJECT: **Kern River Cogeneration Project (82-AFC-2C)**
Public Review of Staff Analysis of Proposed Modification
to allow either Cogen or Simple Cycle Operations

On December 22, 2003, the California Energy Commission (Commission) received a petition from the Kern River Cogeneration Company (KRCC) to modify the Kern River Cogeneration Project (KRCP). The 300-megawatt KRCP was certified in September 1983 and commenced commercial operations in August 1985. The power plant is located approximately five miles north of the City of Bakersfield, and five miles east of State Route 99 in Kern County, California.

KRCC requests that two of the four existing cogeneration units (i.e., natural gas fired combustion turbines equipped with dry Low NOx combustors and heat recovery steam generators) be permitted to operate either in simple-cycle mode, or in cogeneration mode. This request is due to (1) a decline in steam demand from the adjacent oilfield, and (2) the need for flexibility to respond to the current electricity market. No additional physical construction will be necessary to switch between simple-cycle and cogeneration operations.

Commission staff reviewed the proposed modification and assessed the impacts of this proposal on environmental quality, public health and safety. Staff proposes to revise Air Quality Conditions of Certification to allow either cogeneration or simple-cycle operation. It is Commission staff's opinion that, with the implementation of revised conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, section 1769).

The amendment petition has been posted on the Energy Commission's webpage at www.energy.ca.gov/siting. Staff's analysis is attached for your information and review. Staff's analysis and the Order (if the amendment is approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the April 7, 2004 Business Meeting of the Energy Commission. If you have comments on this proposed project change, please submit them to me at the address above, or by e-mail at ntronaas@energy.state.ca.us prior to April 7, 2004. If you have any questions, please call me at (916) 654-3864.

Attachment

Kern River Cogeneration Project (82-AFC-2C)
Petition to allow either Cogeneration or Simple Cycle Operation
Air Quality Staff Analysis
Prepared by: Joseph M. Loyer
March 8, 2004

Amendment Request

The Kern River Cogeneration Company (KRCC) has submitted a petition to the California Energy Commission (Commission) to amend the Conditions of Certification to allow for two of the four turbines at the Kern River Cogeneration Project (KRCP or the Project) the option to operate as simple cycle units or as cogeneration units. KRCC specifically petitions for the deletion of Condition of Certification AQ-13 and minor modifications to Conditions of Certification AQ-2, -17, -18, and -26 to be consistent with the requirements of the San Joaquin Air Pollution Control District (District).

Background

On August 24, 1983 the Commission granted KRCC a license to build and operate the KRCP, a 300 MW power plant in Kern County consisting of four natural gas fired General Electric Frame 7EA combustion turbines and heat recovery steam generators (HRSG). Each HRSG was designed to deliver 450,000 lbs/hr steam at 80% quality to the surrounding oil field for thermal enhanced oil recovery. Kern River has been in operation since August 1, 1985, delivering steam to the oil field and electric power to the grid.

On May 24, 1989 the Commission approved a minor amendment clarifying the definition of shutdown for the HRSG. On February 1, 1995 the Commission approved an amendment that eliminated the option of using oil as a backup fuel for KRCP and significantly amended the Conditions to mimic the Sycamore Project Conditions (a sister cogeneration facility located nearby). On August 25, 1995 the Commission approved a minor amendment regarding a reporting timeframe. On February 9, 2000 the Commission approved the elimination of the one-hour NO_x concentration limit in favor of the one-hour NO_x mass emission limit.

Laws Ordinances Regulations and Statutes

No laws, ordinances, regulations or standards will affect the petitioned amendment requests. However, the District did require KRCC to demonstrate how this petition would not deter the KRCP from complying with District Rule 4703, an applicable pollution device retrofit rule.

Rule 4703 limits the emissions of NO_x and CO from stationary gas turbines. The KRCP turbines are currently in compliance with the emission limits and monitoring requirements of this rule. Rule 4703 also requires future, more stringent emission controls. KRCC has chosen to undertake what is referred to in Rule 4703 as the "Enhanced Option", which requires NO_x emissions to be controlled to 3 ppmv @ 15% O₂ by 2008 or the first major overhaul. The District is satisfied that compliance with Rule 4703 will not be hindered by the approval of this petition.

KRCP has experienced violations of CO limits during startup in the past, but these have been Prevention of Significant Deterioration (PSD) permit violations, not violations of the District or Commission conditions. The current PSD permit does not include any provision for higher emissions during startup or shutdown, as do both the District permit and Commission license. KRCC has requested of EPA, on December 18, 2003, that the PSD permit be updated to match the District and Commission startup limitations to address this situation.

Analysis

KRCC is petitioning the Commission to allow two of the existing four combustion turbines at KRCP to operate in simple cycle mode as opposed to cogeneration mode. This will allow KRCC to respond to a decline in the need for steam production for the oil field while maintaining current power production for the electricity market in accordance with its existing contract and the ability to dispatch under anticipated future market conditions.

While in simple cycle operation, the turbines are expected to start up and shutdown in a single day. While in cogeneration operation, the turbines are expected to start up and stay operational for extended periods of time. KRCC is not petitioning to increase the emission limits of KRCP. Therefore, this assessment will focus on the ability of KRCC to comply with the existing emission limits. However, the District has updated (but not increased) some of the emission limits to be more consistent with current District business practices. Specifically this means the addition of daily emission limits for PM10 and VOC and an hourly emission limit for CO.

Conversion to Simple Cycle Operation

The Project will require no additional construction to convert Units 3 and 4 to simple cycle operation as each unit's flue gases currently pass through a heat recovery steam generator (HRSG) by way of a transition section that is equipped with a gas tight damper and bypass stack. Therefore, for simple cycle operation all that is necessary is to employ the bypass stack. There are no post-combustion emission controls installed at any of the Project units.

Redirection of the exhaust gas through the bypass stack will increase the stack exit temperature and decrease the exit velocity (due to a different stack diameter) and thus will slightly alter the current exhaust plume impacts. KRCC has submitted the appropriate air dispersion modeling for both the current configuration and the proposed simple cycle operation. The modeling results (Appendix A) show there to be a decrease in emission impacts when changing operation from cogeneration to simple cycle. The short term ambient air quality standards (1-hr, 3-hr, 8-hr) show very little difference, typically a 2% to 5% reduction. The long term ambient air quality standards (24-hr and annual) show a much larger reduction from between 28% to 45%. This is primarily due to the lack of operation assumed during the day and year (discussed below) and the changing exhaust conditions. However, it should be noted that KRCP still contributes to an existing violation of the PM10 24-hour and annual ambient air quality standards (both federal and state)

because it is located in an area that is non-attainment for those standards. These impacts have been mitigated by the original offset and mitigation plan originally employed by KRCC.

In a simple cycle configuration, Units 3 and 4 are expected to startup and operate for 6 to 8 hours per day and then shutdown. KRCP is expected to operate in response to market demands, which will likely be most frequent in the summer months. However, to be conservative and not incur any additional limiting conditions, KRCC has assumed that the Project will operate 24 hours per day 5 days per week (including startup and shutdowns). KRCP is not expected to have different emission rates during simple cycle operation than cogeneration operation due to the fact that there are no post combustion controls in either configuration. KRCC has based their emission rate assumptions on recent source testing, continuous emission monitoring system (CEMS) and AP-42 emission factors (Appendix B). The AP-42 emissions factors were used only for the startup and shutdown emission estimates of volatile organic compounds (VOC) and were multiplied by 10 to be conservative. Based on emission records and the conservative nature of the assumptions made, staff is confident that KRCC can operate KRCP well within their current emission limits.

Minor Modifications of the District Permit

The District has made some minor modifications to the permits for the KRCP project to be consistent with current District business practices. This will be the addition of three daily limits (PM₁₀, SO_x and VOC), the inclusion of a 3-hr rolling mass emissions limit for CO and the merger of the current SO₂ and SO₄ emission limits into a higher SO_x (reported as SO₂) emission limit. In addition, the District will be adding a new 1-hr average CO emission limit for startups and shutdowns. These changes do not constitute higher emission limits except for the new 1-hr CO emission limit during startup and shutdown. The proposed emission limits are presented in Air Quality Table 1 and compared to the current emission limits. Furthermore, there are other minor modifications to eliminate the references to water injection for NO_x emission controls which were replaced (in a past amendment) with dry-low NO_x combustors. The most significant of these minor modifications will be in AQ-17 and 18, which currently includes references to the water injection control combustors and the emission limits for the Project.

AIR QUALITY Table 1
Comparison of Current Short-term Limits (AQ-17 &18) to Proposed Limits

Pollutant	Current Limit	Proposed Limit	Notes
PM10	5.0 lbm/hr	same	
	--	120.0 lbm/day	Assumes 24hr operation at 5 lbm/hr
SO2	0.5 lbm/hr	0.9 lbm/hr (SOx as SO2)	Combined with SO4 emission limit
	none	21.6 lbm/day (SOx as SO2)	Combined with SO4 emission limit
SO4	0.6 lbs/hr	Deleted	Combined with SO2 emission limit
NOx	79.7 lbm/hr	same	1 hour average
	16.4 ppm	same	3 hr average
	67.9 lbm/hr	same	3 hr average
	1629.6 lbm/day	same	24 hr average
NOx – Startup & Shutdown	140 lb/hr	Same	2 hr average
VOC	12.0 lbm/hr	same	
	--	288.0 lbm/day	Assumes 24hr operation at 12 lbm/hr
CO	1056 lbm/day	same	
	25 ppm	same	
	--	44.0 lbm/hr	3 hr average Assumes 24hr operation averaged from 1056 lbm/day
CO - Startup & Shutdown	140 lb/hr	same	2 hr average
CO - Startup & Shutdown	none	200 lb/hr	1 hr average

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Conclusions and Recommendations

Staff has analyzed the proposed changes and concludes that there are no new or additional significant impacts associated with approval of the petition. Staff concludes that the proposed changes are based on information that was not available during the original licensing process. Staff concludes that the proposed language retains the intent of the original Commission Decision and Conditions of Certification. Staff recommends the

deletion of Condition of Certification AQ-13 and the following modifications to Conditions AQ-2, -17, -18, and -26.

PROPOSED MODIFICATIONS TO THE EXISTING AIR QUALITY CONDITIONS OF CERTIFICATION

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AQ-2 Kern River Cogeneration Company shall design the Kern River Project using the following design conditions and specific equipment:

Equipment Description:

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A. Four natural gas ~~or light oil~~ fired General Electric, Model G7111E, combustion turbine generators (CTG's) each rated at 8.25×10^8 Btu/hr (LHV) maximum heat input (APCD No.'s S-88-1-12 through -4-12),

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B. Four unfired heat recovery steam generators (HRSG's), each rated at 450,000 lbm/hr steam production one for each gas turbine engine assembly,

C. Four CTG ~~Dry-Low NOx combustor water or steam injection~~ systems for NOx control, ~~one for each CTG~~,

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D. Continuous emission monitoring system for NOx, CO and CO2 serving each CTG flue gas stream,

~~E. Two 600 gpm demineralizes to provide steam or water, respectively to injection systems,~~

F. 2000 hp diesel I.C. engine driving "black-start" electrical generator (APCD No. S-88-5-2),

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G. Facility will include one 250 hp diesel I.C. engine driving 1500 gpm fire water pump (APCD No. S-88-8-1).

H. Turbine maximum heat input rate shall not exceed 1,020 MMBtu/hr when fired on natural gas without prior District approval.

General Design Requirements:

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A. When operating in cogeneration mode, the Exhaust gas ducting from CTGs through HRSGs to the atmosphere shall be gas-tight.

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B. When operating in simple cycle mode, the Bypass stack valve preceding each HRSG shall be designed to be gas tight.

C. Each CTG shall have a fuel consumption monitor/recorder.

Design Requirements for CTG - DLN Retrofit:

- A. The combustion turbine generators (CTGs) shall be retro fitted with dry low NOx (DLN) combustors, capable of achieving 16.4 ppm or better at 15% O2 based on a three hour rolling according to the schedule in Condition AQ-27.
- B. CTGs using multiple combustors shall be designed to be capable of achieving proposed emission levels.

Verification: Kern River Cogeneration Company shall maintain and make available for inspection the "Approved for Construction Drawings" to the SJVUAPCD, CARB, and CEC upon reasonable notice (1 hour for weekdays, 8 hours for weekends and holidays). Kern River Cogeneration Company shall make the site available for inspection by the SJVUAPCD, CARB, and CEC during both construction and operation upon reasonable notice (1 hour for weekdays, 8 hours for weekends and holidays).

~~AQ-13 The Kern River Project facility shall operate as a cogeneration facility pursuant to Public Resources Code Section 25134 for thermally enhanced oil recovery operations.~~

~~**Verification:** Kern River Cogeneration Company shall maintain records on steam production as a portion of the operation log required in Condition AQ-11. The record shall include, but is not limited to, hours of operation of the turbines and HRSGs, lb/hr of steam produced, and temperature and pressure of steam produced.~~

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AQ-17 a. Startup or planned shutdown of a CTG shall not exceed a time period of two (2) continuous hours.

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b. For all CTGs the following hourly emission limits shall apply during times of startup or planned shutdown and shall be averaged over the time period specified below two hour period allowed for startup or planned shutdown:

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NO ₂	140 lbm/hr (2-hr average) not to exceed 3360 lb/day
CO	<u>200 lbm/hr (1-hr average).</u> 140 lbm/hr (2-hr average) not to exceed 3360 lb/day

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AQ-18 Pollutant emissions from each combustion turbine prior to being retrofitted with the Dry Low NO_x combustor shall not exceed the following limits, except during times of startup or shutdown as defined in Condition AQ-17:

Gas Fired Case:

Particulates	-5.0 lbm/hr as PM10
Sulfur Compounds	-0.5 lbm/hr as SO₂ -0.6 lbm/hr as SO₄
Oxides of Nitrogen	-140.0 lbm/hr as NO₂
Hydrocarbons	-12.0 lbm/hr (Non-meth)
Carbon Monoxide	-21.0 lbm/hr

Pollutant emissions from each ~~Dry Low NO_x-equipped~~ combustion turbine shall not exceed the following limits except during times of startup or shutdown as defined in Condition AQ-17:

Gas Fired Case:

Particulates	- 5.0 lbm/hr as PM10 - 120.0 lbm/day as PM10
Sulfur Compounds	- 0.9 0.5 lbm/hr as <u>SO_x (as SO₂)</u> <u>-21.6 lb/day as SO_x (as SO₂)</u> -0.6 lbm/hr as SO₄
Oxides of Nitrogen	- 1629.6 lbm/day as NO ₂ - 67.9 lbm/hr as NO ₂ , 3 hour rolling average - 16.4 ppmv at 15% O ₂ , 3 hour rolling average Not to exceed
Hydrocarbons	- 79.7lbm/hr, <u>1 hour average</u> -12.0 lbm/hr (Non-methane) <u>- 288.0 lbm/day</u>
Carbon Monoxide	-1056 lbm/day and - 25 ppmv at 15% O ₂ <u>- 44.0 lbm/hr, 3-hour rolling average</u>

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Protocol: For nitrogen dioxide, the Kern River Cogeneration Company (KRCC) shall identify the following for each day of operation, except during times of start up or shutdown, as defined in Condition AQ-17:

- (1) the daily maximum hourly mass emission rate (lbs/hr),
- (2) the daily maximum rolling 3-hour average mass emission rate (lbs/hr) and
- (3) the total daily mass emissions (lbs/day).

For carbon monoxide, KRCC shall identify the total daily mass emissions (lbs/day) for each day of operation, except during times of start up or shutdown, as defined in Condition AQ-17.

For particulate matter (PM10), sulfur compounds (SO₂ and SO₄) and non-methane hydrocarbons, KRCC shall determine through the initial source test, the

fuel-based emission factors (lbs/mmBtu) for each pollutant. Using these factors, KRCC shall determine the maximum allowable fuel input rate (mmBtu/hr) that would comply with the above stated emission limits (lbs/hr) (i.e., emission limit / emission factor = fuel input rate). KRCC shall then compare these fuel input rates (as determined above) with the actual daily maximum fuel input rate (mmBtu/hr) for each day of operation, except during times of start up or shutdown, as defined in Condition AQ-17.

KRCC shall submit all excess emission reports and break down reports to demonstrate compliance with all concentration limits.

Verification: KRCC shall submit quarterly emission reports with all the information identified in the above protocol to the CEC compliance project manager.

AQ-26 Prior to installation, Kern River Cogeneration Company shall provide to SJVUAPCD details of design as they relate to air contaminant generation, emission, or control potential of the following: CTG DLN combustion systems; ~~and NOx control water injection system.~~

Verification: Kern River Cogeneration Company shall provide the above information to the SJVUAPCD and CEC 60 days before installation of the equipment identified in Condition AQ-26.

APPENDIX A

Modeling Results

The modeling in the following table (reproduced from the submitted petition) shows the Kern River project as it currently operates (cogeneration), as it is proposed to operate (simple cycle) and in conjunction with the Sycamore Cogeneration Power Plant (a sister facility located near by). As can be seen there is an overall decrease in emission impacts. This is due primarily to the increase in exhaust temperature, producing more dispersion of the pollutants being emitted, and the proposed less operational hours throughout the year.

Based on this modeling and the intended simple cycle operation, staff believes that the long-term standards (24-hour and annual) will indeed see a reduction in emission impacts. Staff also believes that the proposed modified operation of the Project would not increase the emission impacts on the short-term standards (1-hour, 3-hour, and 8-hour) in comparison to the Project's original operation. Therefore, no further mitigation will be necessary than what has already been submitted.

Comment:

Regardless of the PM10 emission impacts, the Project still contributes to an existing violation of both the federal and state PM10 24-hour and annual ambient air quality standards. However, since KRCC originally mitigated the Project's PM10 emission impacts and the new proposed operation (simple cycle) will not exceed the current emission limits and will also actually decrease the PM10 emission impacts, staff finds that further mitigation is not required.

Pollutant	Averaging Period	Maximum Modeled Impact (ug/m3)	Background (ug/m3)	Total Predicted Concentration (ug/m3)	Ambient Air Quality Standard (ug/m3)	% of AAQS
Current Kern River Cogeneration Operation Impacts						
CO	1-hour	342.5	11,764	12,106	23,000	52.6%
	8-hour	30.9	6,266	6,297	10,000	63.0%
NO2	1-hour	239.8	145	385.2	470	82.0%
	Annual	1.46	31	32.1	100	32.1%
PM10	24-hour	0.77	158	158.8	50	317.5%
	Annual	0.11	47	47.1	30	157.0%
SO2	1-hour	0.86	80	80.8	655	12.3%
	3-hour	0.39	80	80.3	1,300	6.2%
	24-hour	0.08	17	16.9	105	16.1%
	Annual	0.01	9	8.5	80	10.6%
Proposed Kern River Simple Cycle Operation Impacts						
CO	1-hour	335.6	11,764	12,100	23,000	52.6%
	8-hour	22.2	6,266	6,288	10,000	62.9%
NO2	1-hour	234.9	145	380.3	470	80.9%
	Annual	0.82	31	31.4	100	31.4%
PM10	24-hour	0.73	158	158.7	50	317.5%
	Annual	0.06	47	47.1	30	156.9%
SO2	1-hour	0.84	80	80.7	655	12.3%
	3-hour	0.44	80	80.3	1,300	6.2%
	24-hour	0.07	17	16.9	105	16.1%
	Annual	0.01	9	8.5	80	10.6%
Cumulative Impacts from Kern River (simple cycle) and Sycamore						
CO	1-hour	379.3	11,764	12,143	23,000	52.8%
	8-hour	42.0	6,266	6,308	10,000	63.1%
NO2	1-hour	265.5	145	410.9	470	87.4%
	Annual	1.80	31	32.4	100	32.4%
PM10	24-hour	1.00	158	159.0	50	318.0%
	Annual	0.13	47	47.1	30	157.1%
SO2	1-hour	0.95	80	80.9	655	12.3%
	3-hour	0.48	80	80.4	1,300	6.2%
	24-hour	0.11	17	16.9	105	16.1%
	Annual	0.01	9	8.5	80	10.6%

The background ambient air pollution measurements were the highest recorded at the Oildale monitoring station from 2000 to 2002.

Note – Above CO 1-hr impacts and corresponding percentages were updated to reflect SJVAPCD proposed 1-hr CO limit of 200 lb/hr v. CO 1-hr emission of 140 lb/hr originally modeled by Applicant.

APPENDIX B

Comparison of Expected Actual Emission Rates to Proposed Emission Limitations

KRCC presented the emission factors in AIR QUALITY Appendix B Table 1 as a clear demonstration that the KRCP was meeting all emission limits imposed by the Commission and the District and that they would continue to do so with the approval of this petition. These emission limits are based primarily on the continuous emission monitoring system (CEMS) and compliance source testing. However, for the VOC emission during startup or shutdown, KRCC had no such information. Therefore, KRCC used the available data from US EPA AP-42, a compendium of emission factors. However, in order to present a more conservative picture, KRCC multiplied the AP-42 VOC emission factor by 10.

**AIR QUALITY Appendix B Table 1
Actual Emissions from Kern River Cogeneration Power Project**

Emission	Emission Factor	Units	Comments
Normal Operation			
NOx	33.60	lbs/hour	average of CEMS recorded from 11/01 to 10/03
CO	5.70	lbs/hour	average of CEMS recorded from 11/01 to 10/03
PM10	2.54	lbs/hour	Source Test
VOC	--	--	Source Test showed negligible results.
SO2	0.17	lbs/hr	mass balance based on monthly fuel test
Startup/Shutdown			
CO and NOx	140	lbs/hr	Emission Limit
VOC	0.021	lbs/MMBtu	assumes 10 times estimated emission from AP-42
SO2	0.000168	lbs/MMBtu	assumes the same emissions as during normal operation
PM10	0.00249	lbs/MMBtu	assumes the same emissions as during normal operation

AIR QUALITY Appendix B Tables 2, 3 and 4 show the effect that these emission factors have on the proposed project (simple cycle operation). The VOC emission during normal

operation has been non-detectable in all source tests performed at the KRCP. Staff has replaced that zero value with 11 lbm/hr to demonstrate that the project will comply with emission limits even with this overly conservative assumption.

AIR QUALITY Appendix B Table 2

Estimated Actual Hourly Emissions from Proposed Kern River Simple Cycle Project

Units	Mode	Hourly Emission Rates (lbs/hour)				
		NOx	CO	VOC	SO2	PM10
3	Startup	140.00	140.00	21.42	0.17	2.54
	Operation	33.60	5.70	11.00	0.17	2.54
4	Startup	140.00	140.00	21.42	0.17	2.54
	Operation	33.60	5.70	11.00	0.17	2.54

AIR QUALITY Appendix B Table 3

Estimated Actual Daily Emissions from Proposed Kern River Simple Cycle Project

Units	Hours		Daily Emissions (lbs/day)				
	Startup	Normal Operation	NOx	CO	VOC	SO2	PM10
3	2		280.00	280.00	42.85	0.31	5.08
		22	739.23	125.31	242.00	3.77	55.85
4	2		280.00	280.00	42.85	0.31	5.08
		22	739.23	125.31	242.00	3.77	55.85
Estimated emissions for each Unit			1,019.23	405.31	284.85	4.08	60.92
Estimated emissions for both units			2,038.46	810.62	569.69	8.15	121.85

AIR QUALITY Appendix B Table 4

Estimated Actual Annual Emissions from Proposed Kern River Simple Cycle Project

Units	Hours		Annual Emissions (tons/year)				
	Startup	Normal Operation	NOx	CO	VOC	SO2	PM10
3	2		36.4	36.4	5.57	0.04	0.66
		22	96.1	16.29	31.46	0.49	7.26
4	2		36.4	36.4	5.57	0.04	0.66
		22	96.1	16.29	31.46	0.49	7.26
Estimated emissions from both units			265	105.38	11.14	1.06	15.84

AIR QUALITY Appendix B Table 5 shows the comparison of the KRCP emission limits (Condition of Certification AQ-18) to the project expected emissions from the above assumptions, source tests and CEMS data. The hourly VOC emission limit for the Project turbines is 12 lbs/hr, but each source test performed has resulted in no detectable VOC emissions. Therefore, staff assumed that the emission rate would be less than the limit and assigned a value of 11 lbm/hr. This gross, over-estimated hourly VOC emission resulted in an estimated daily VOC emission of 284.85 lbm/day, which is below the emission limit of 288 lbm/day. Therefore, staff is confident that KRCC can continue to operate the Project in compliance with the project proposed emission limits.

AIR QUALITY Appendix B Table 5
Comparison of Proposed Emission Limits and Expected Actual Project Emissions

Pollutant	Current or Proposed Limit	Expected <u>Actual</u> Project Emissions
PM10	5 lbm/hr	2.54 lbm/hr
	120 lbm/day	60.92 lbm/day
SO2	0.9 lbm/hr	0.17 lbm/hr
NOx	79.7 lbm/hr	33.6 lbm/hr
	1,629.6 lbm/day	1,019.23 lbm/day
VOC	12 lbm/hr	Not Detectable
	288 lbm/day	See Discussion
CO	44 lbm/hr	5.70 lbm/hr
	1056 lbm/day	405.31 lbm/hr